Appendix I to 40 CFR Part 264 -- Recordkeeping Instructions

The recordkeeping provisions of § 264.73 specify that an owner or operator must keep a written operating record at his or her facility. This appendix provides additional instructions for keeping portions of the operating record. See § 264.73(b) for additional recordkeeping requirements.

The following information must be recorded, as it becomes available, and maintained in the operating record until closure of the facility in the following manner:

Records of each hazardous waste received, treated, stored, or disposed of at the facility which include the following:

(1) A description by its common name and the EPA Hazardous Waste Number(s) from part 261 of this chapter which apply to the waste. The waste description also must include the waste's physical form, i.e., liquid, sludge, solid, or contained gas. If the waste is not listed in part 261, subpart D, of this chapter, the description also must include the process that produced it (for example, solid filter cake from production of ----, EPA Hazardous Waste Number W051).

Each hazardous waste listed in part 261, subpart D, of this chapter, and each hazardous waste characteristic defined in part 261, subpart C, of this chapter, has a four-digit EPA Hazardous Waste Number assigned to it. This number must be used for recordkeeping and reporting purposes. Where a hazardous waste contains more than one listed hazardous waste, or where more than one hazardous waste characteristic applies to the waste, the waste description must include all applicable EPA Hazardous Waste Numbers.

(2) The estimated or manifest-reported weight, or volume and density, where applicable, in one of the units of measure specified in Table 1;

Table 1

Unit of measure	Code[1]
Gallons	G
Gallons per Hour	E
Gallons per Day	U
Liters	L
Liters per Hour	H
Liters per Day	V

Short Tons per Hour	D
Metric Tons per Hour	W
Short Tons per Day	N
Metric Tons per Day	S
Pounds per Hour	J
Kilograms per Hour	R
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu's per Hour	I

FOOTNOTE: [1]Single digit symbols are used here for data processing purposes.

(3) The method(s) (by handling code(s) as specified in Table 2) and date(s) of treatment, storage, or disposal.

Table 2.-Handling Codes for Treatment, Storage and Disposal Methods

Enter the handling code(s) listed below that most closely represents the technique(s) used at the facility to treat, store or dispose of each quantity of hazardous waste received.

1. Storage

S01 Container (barrel, drum, etc.)

S02 Tank

S03 Waste Pile

S04 Surface Impoundment

S05 Drip Pad

S06 Containment Building (Storage)

S99 Other Storage (specify)

2. Treatment

(a) Thermal Treatment--

T06 Liquid injection incinerator

T07 Rotary kiln incinerator

T08 Fluidized bed incinerator

T09 Multiple hearth incinerator

T10 Infrared furnace incinerator

T11 Molten salt destructor

T12 Pyrolysis

T13 Wet air oxidation

T14 Calcination

T15 Microwave discharge

T18 Other (specify)

(b) Chemical Treatment--

T19 Absorption mound

T20 Absorption field

T21 Chemical fixation

T22 Chemical oxidation

T23 Chemical precipitation

T24 Chemical reduction

T25 Chlorination

T26 Chlorinolysis

T27 Cyanide destruction

T28 Degradation

T29 Detoxification

T30 Ion exchange

T31 Neutralization

T32 Ozonation

T33 Photolysis

T34 Other (specify)

(c) Physical Treatment--

(1) Separation of components:

T35 Centrifugation

T36 Clarification

T37 Coagulation

T38 Decanting

T39 Encapsulation

T40 Filtration

T41 Flocculation

T42 Flotation

T43 Foaming

T44 Sedimentation

T45 Thickening

T46 Ultrafiltration

T47 Other (specify)

(2) Removal of Specific Components:

T48 Absorption-molecular sieve

T49 Activated carbon

T50 Blending

T51 Catalysis

T52 Crystallization

T53 Dialysis

T54 Distillation

T55 Electrodialysis

T56 Electrolysis

T57 Evaporation

T58 High gradient magnetic separation

T59 Leaching

T60 Liquid ion exchange

T61 Liquid-liquid extraction

T62 Reverse osmosis

T63 Solvent recovery

T64 Stripping

T65 Sand filter

T66 Other (specify)

(d) Biological Treatment

T67 Activated sludge

T68 Aerobic lagoon

T69 Aerobic tank

T70 Anaerobic tank

T71 Composting

T72 Septic tank

T73 Spray irrigation

T74 Thickening filter

T75 Tricking filter

T76 Waste stabilization pond

T77 Other (specify)

T78 [Reserved]

T79 [Reserved]

(e) Boilers and Industrial Furnaces

T80 Boiler

T81 Cement Kiln

T82 Lime Kiln

T83 Aggregate Kiln

T84 Phosphate Kiln

T85 Coke Oven

T86 Blast Furnace

T87 Smelting, Melting, or Refining Furnace

T88 Titanium Dioxide Chloride Process Oxidation Reactor

T89 Methane Reforming Furnace

T90 Pulping Liquor Recovery Furnace

T91 Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid

T92 Halogen Acid Furnaces

T93 Other Industrial Furnaces Listed in 40 CFR 260.10 (specify)

(f) Other Treatment

T94 Containment Building (Treatment)

3. Disposal

D79 Underground Injection

D80 Landfill

D81 Land Treatment

D82 Ocean Disposal

D83 Surface Impoundment (to be closed as a landfill)

D99 Other Disposal (specify)

4. Miscellaneous (Subpart X)

X01 Open Burning/Open Detonation

X02 Mechanical Processing

X03 Thermal Unit

X04 Geologic Repository

X99 Other Subpart X (specify)

Appendix IV to Part 264 -- Cochran's Approximation to the Behrens-Fisher Students' T-Test

Using all the available background data (n_b readings), calculate the background mean (X_b) and background variance (s_b^2). For the single monitoring well under investigation (n_m reading), calculate the monitoring mean (X_m) and monitoring variance (s_m^2).

For any set of data (X_1 , X_2 , . . ., X_n) the mean is calculated by:

$$\overline{X} = \frac{X_1 + X_2 \ldots + X_n}{n}$$

and the variance is calculated by:

$$s^2 = \frac{(X_1 - \overline{X})^2 + (X_2 - \overline{X})^2 \ldots + (X_n - \overline{X})^2}{n-1}$$

where "n" denotes the number of

observations in the set of data.

The t-test uses these data summary measures to calculate a t-statistic (t^*) and a comparison t-statistic (t_c). The t^* value is compared to the t_c value and a conclusion reached as to whether there has been a statistically significant change in any indicator parameter.

The t-statistic for all parameters except pH and similar monitoring parameters is:

$$t^* = \frac{X_m - \overline{X}_s}{\sqrt{\frac{S_m^2}{n_m} + \frac{S_b^2}{n_b}}}$$

$$t^* = \frac{X_m - \overline{X}_S}{\sqrt{\frac{S_m^2}{n_m} + \frac{S_b^2}{n_b}}}$$

If the value of this t-statistic is negative then there is no significant difference between the monitoring data and background data. It should be noted that significantly small negative values may be indicative of a failure of the assumption made for test validity or errors have been made in collecting the background data.

The t-statistic (t_c), against which t^* will be compared, necessitates finding t_b and t_m from standard (one-tailed) tables where,

t_b = t-tables with (n_b-1) degrees of freedom, at the 0.05 level of significance.

t_m = t-tables with (n_m-1) degrees of freedom, at the 0.05 level of significance.

Finally, the special weightings W_b and W_m are defined as:

$$W_B = \frac{s_b^2}{n_b} \quad and \quad W_m = \frac{s_m^2}{n_m}$$

and so the comparison t-statistic is:

$$t_c = \frac{W_b t_b + W_m t_m}{W_b + W_m}$$

The t-statistic (t^*) is now compared with the comparison t-statistic (t_c) using the following decision-rule:

If t^* is equal to or larger than t_c , then conclude that

there most likely has been a significant increase in this specific parameter.

If t^* is less than t_c, then conclude that most likely there has not been a change in this specific parameter.

The t-statistic for testing pH and similar monitoring parameters is constructed in the same manner as previously described except the negative sign (if any) is discarded and the caveat concerning the negative value is ignored. The standard (two-tailed) tables are used in the construction t_c for pH and similar monitoring parameters.

If t^* is equal to or larger than t_c, then conclude that there most likely has been a significant increase (if the initial t^* had been negative, this would imply a significant decrease). If t^* is less than t_c, then conclude that there most likely has been no change.

A further discussion of the test may be found in "Statistical Methods" (6th Edition, Section 4.14) by G. W. Snedecor and W. G. Cochran, or "Principles and Procedures of Statistics" (1st Edition, Section 5.8) by R. G. D. Steel and J. H. Torrie.

Standard T-Tables 0.05 Level of Significance

Degrees of freedom	t-values (one-tail)	t-values (two-tail)
1	6.314	12.706
2	2.920	4.303
3	2.353	3.182
4	2.132	2.776
5	2.015	2.571
6	1.943	2.447
7	1.895	2.365
8	1.860	2.306
9	1.833	2.262

10	1.812	2.228
11	1.796	2.201
12	1.782	2.179
13	1.771	2.160
14	1.761	2.145
15	1.753	2.131
16	1.746	2.120
17	1.740	2.110
18	1.734	2.101
19	1.729	2.093
20	1.725	2.086
21	1.721	2.080
22	1.717	2.074
23	1.714	2.069
24	1.711	2.064
25	1.708	2.060
30	1.697	2.042
40	1.684	2.021

Adopted from Table III of "Statistical Tables for Biological, Agricultural, and Medical Research" (1947, R. A. Fisher and F. Yates).

Appendix V to Part 264 -- Examples of Potentially Incompatible Waste

Many hazardous wastes, when mixed with other waste or materials at a hazardous waste facility, can produce effects which are harmful to human health and the environment, such as (1) heat or pressure, (2) fire or explosion, (3) violent reaction, (4) toxic dusts, mists, fumes, or gases, or (5) flammable fumes or gases.

Below are examples of potentially incompatible wastes, waste components, and materials, along with the harmful consequences which result from mixing materials in one group with materials in another group. The list is intended as a guide to owners or operators of treatment, storage, and disposal facilities, and to enforcement and permit granting officials, to indicate the need for special precautions when managing these potentially incompatible waste materials or components.

This list is not intended to be exhaustive. An owner or operator must, as the regulations require, adequately analyze his wastes so that he can avoid creating uncontrolled substances or reactions of the type listed below, whether they are listed below or not.

It is possible for potentially incompatible wastes to be mixed in a way that precludes a reaction (e.g., adding acid to water rather than water to acid) or that neutralizes them (e.g., a strong acid mixed with a strong base), or that controls substances produced (e.g., by generating flammable gases in a closed tank equipped so that ignition cannot occur, and burning the gases in an incinerator).

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Group 1-A

Acetylene sludge
Alkaline caustic liquids
Alkaline cleaner
Alkaline corrosive liquids
Alkaline corrosive battery fluid
Caustic wastewater
Lime sludge and other corrosive alkalies
Lime wastewater
Lime and water
Spent caustic

Group 1-B

Acid sludge

Acid and water
Battery acid
Chemical cleaners
Electrolyte, acid
Etching acid liquid or solvent
Pickling liquor and other corrosive acids
Spent acid
Spent mixed acid
Spent sulfuric acid

Potential consequences: Heat generation; violent reaction.

Group 2-A

Aluminum
Beryllium
Calcium
Lithium
Magnesium
Potassium
Sodium
Zinc powder
Other reactive metals and metal hydrides

Group 2-B

Any waste in Group 1-A or 1-B

Potential consequences: Fire or explosion; generation of flammable hydrogen gas.

Group 3-A

Alcohols
Water

Group 3-B

Any concentrated waste in Groups 1-A or 1-B
Calcium
Lithium
Metal hydrides
Potassium
SO_2Cl_2, $SOCl_2$, PCl_3, CH_3SiCl_3
Other water-reactive waste

Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

Group 4-A

Alcohols

Aldehydes
Halogenated hydrocarbons
Nitrated hydrocarbons
Unsaturated hydrocarbons
Other reactive organic compounds and solvents

Group 4-B

Concentrated Group 1-A or 1-B wastes
Group 2-A wastes

Potential consequences: Fire, explosion, or violent reaction.

Group 5-A

Spent cyanide and sulfide solutions

Group 5-B

Group 1-B wastes

Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulfide gas.

Group 6-A

Chlorates
Chlorine
Chlorites
Chromic acid
Hypochlorites
Nitrates
Nitric acid, fuming
Perchlorates
Permanganates
Peroxides
Other strong oxidizers

Group 6-B

Acetic acid and other organic acids
Concentrated mineral acids
Group 2-A wastes
Group 4-A wastes
Other flammable and combustible wastes

Potential consequences: Fire, explosion, or violent reaction.

Source: "Law, Regulations, and Guidelines for Handling of

Hazardous Waste." California Department of Health, February 1975.